

JC13 Rec'd PCT/PTO 29 JAN 2002

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CLAIMS:

1. A surgical device (1) for use in minimally invasive surgery of the type where a body cavity is inflated to be accessible to a surgeon through an access port surrounding an incision in a patient's body, the device (1) being formed to allow insertion of medical equipment and comprising: -

a cannula (6) defining a conduit into the body cavity;

10 a trocar (5) carried on the cannula (6) and formed for piercing or cutting tissue to position the cannula (6); and

15 fixing means (7) for removably securing the cannula (6) in position on the patient during surgery,

15 characterised in that the trocar (5) is removably mounted on the cannula (6), with the trocar (5) providing a gas-tight cap for the cannula when the trocar is mounted on the cannula thereby enabling the trocar (5) to be inserted into the body cavity through the access port and to cut or pierce tissue outwardly from within the body cavity out to an operating site, with no escape of gas from the body cavity.

2. A surgical device as claimed in claim 1, wherein the trocar (5) and cannula (6) are removably mounted with complementary engageable short threads (12).

25 3. A surgical device (1) as claimed in claim 1 or claim 2, wherein the trocar (5) is provided with an integral cutting element (8), thereby facilitating the cutting of the body cavity wall (2) to allow introduction of the cannula (6).

30 4. A surgical device (1) as claimed in claim 3, wherein the trocar (5) incorporates an extension shoulder (9).

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5. A surgical device (1) as claimed in any preceding claim, wherein the trocar (5) incorporates guard means for preventing injury to the surgeon.
6. A surgical device (1) as claimed in any preceding claim, wherein the cannula (6) incorporates means (15) for releaseably attaching the cannula to an interior (3) of the body cavity.
7. A surgical device as claimed in claim 6, wherein the means (15) for attaching the cannula (6) to an interior (3) of the body cavity is provided by an internal distal ring (15).
8. A surgical device (1) as claimed in claim 7, in which the internal distal ring (15) and the cannula (6) are integrally formed as a single unit.
9. A surgical device (1) as claimed in any preceding claim, wherein the cannula (6) incorporates a valve to prevent loss of gas from the body cavity when the cannula is in position.
10. A surgical device as claimed in any preceding claim, wherein the fixing means incorporates an anchor ring (7) formed for releasable engagement with a proximal end of the cannula (6) extending from the body when the cannula (6) is in position in the body cavity.
11. A surgical device as claimed in claim 10, wherein the anchor ring (7) incorporates a thread for engaging on the same thread (12) used to secure the trocar (5) prior to installation of the cannula (6).
12. A surgical device as claimed in claim 10 or 11, wherein the anchor ring (7) incorporates a valve.
13. A surgical device as claimed in any preceding claim, incorporating an external seal (901) and an internal valve (902), the seal (901) and valve (902) being mounted about opposing ends of the cannula (6).

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14. A surgical device as claimed in claim 13, wherein the cannula (6) is integrally formed with the seal (901) and valve (902).

5 15. A surgical device as claimed in claim 13 or 14, wherein the valve (902) is integrally formed at one end of the cannula (6) and has means (905) for releaseably engaging a seal housing (901) at an opposing end.

10 16. A surgical device as claimed in claim 15, in which the seal housing (901) incorporates a diaphragm seal.

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17. A surgical device as claimed in any of claims 13 to 16, wherein the seal housing (901) defines an extended entry port (904).

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15 18. A surgical device as claimed in claim 17, wherein the entry port (904) has a conical section.

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19. A surgical device as claimed in any preceding claim, wherein the cannula (6) incorporates an insufflation port (910).

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20 20. A surgical device as claimed in claim 19, in which the insufflation port (910) communicates with an insufflation lumen (912) having insufflation ducts (911) communicating between the port (910) and the body cavity.

25 21. A surgical device as claimed in claim 20, wherein the insufflation lumen (912) is carried on an exterior surface of the cannula (6).

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22. A surgical device as claimed in any of claims 11 to 21, wherein the anchor ring (7) incorporates cushion means to prevent trauma to the body cavity wall and ensure a gas tight seal.

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23. A surgical device as claimed in any of claims 11 to 22, wherein the distal ring (15) incorporates cushion means to prevent trauma to the body cavity wall and ensure a gas tight seal.

5 24. A surgical device as claimed in any preceding claim, incorporating a detachable security retainer formed for engagement with a surgeon's hand or instrument to prevent loss of the device in the cavity prior to being fixed in position on a patient.

10 25. A surgical device as claimed in any preceding claim, incorporating an adjustable pressure release valve.

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